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Application No. 09/462,067

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

10/3

Applicant: Masakazu FURUKAWA et al.

Art Unit 3742

Appl. No.: 09/462,067 (National Stage of
PCT/JP99/03086)

Examiner: S. Paik

Intl Appl. Filed: June 9, 1999

U.S. Appl. Filed: January 5, 2000

For: CERAMIC HEATER AND METHOD OF PRODUCING THE SAME AND
ELECTRICALLY CONDUCTIVE PASTE FOR HEATING BODY

**APPELLANTS' REPLY BRIEF UNDER 37 C.F.R. 1.193(B)(1)
IN RESPONSE TO EXAMINER'S ANSWER**

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Commissioner of Patents and Trademarks
Washington, D.C. 20231

MAR 13 2003
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Sir:

Appellants respectfully submit herewith the Reply Brief to the Examiner's Answer mailed
January 10, 2003.

Appellants are submitting this Reply Brief within two months of mailing of the Examiner's
Answer, whereby this Reply Brief is timely filed by March 10, 2003.

This Reply Brief is submitted in triplicate for the convenience of the Board of Patent Appeals
and Interferences (hereinafter also referred to as "Board"). Although neither a fee nor an extension
of time is believed to be due with this Reply Brief, if any fee is required for consideration of this
Reply Brief, authorization is hereby provided to charge any required fee due to Deposit Account No.
19-0089.

Appellants note that the present Reply Brief is being filed to address matters raised in the Examiner's Answer, to correct several misstatements in the Examiner's Answer, and to emphasize certain arguments. This will ensure that the record will be as clear as possible for consideration of the appeal by the Board.

The Examiner's Answer Improperly Asserts That The Brief Does Not Contain A Statement Identifying The Related Appeals And Interferences

The Examiner's Answer asserts in Section (2), at the top of page 2, that, "The brief does not contain a statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the Brief. Therefore, the Examiner's Answer indicates that it presumed that there are none, and also indicates that the Board may exercise its discretion to require an explicit statement as to the existence of any related appeals and interferences.

In contrast to the above-noted assertion in the Examiner's Answer, Appellants respectfully point out that in their Appeal Brief, in Section 2., **Related Appeals and Interferences**, on page 3, Appellants have specifically complied with 37 C.F.R. 1.192 by stating that:

Appellants are not aware of any other appeals or interferences which will directly affect or be directly affected by or have a bearing on the decision of the Board of Patent Appeals and Interferences in this pending appeal.

From the above, it is seen that the assertion of a lack of a statement identifying related appeals and interferences is in error. Appellants have specifically indicated that there are no related

appeals or interferences, and no presumption is necessary so that the Board need not exercise any discretion to require an explicit statement.

Clarification Of Grounds Of Rejection

In Section (10) of the Examiner's Answer, two grounds of rejection are set forth, as follows:

Claims 7 and 25 are rejected under 35 U.S.C. 112, second paragraph (set forth in prior Office Action, Paper No. 12).

Claims 1, 3-7 and 25-28 are rejected under 35 U.S.C. 103(a) (set forth in prior Office Action, Paper No. 12).

A review of these two grounds of rejection reveals that a rejection of each of the claims under prosecution in the application is not included therein. In particular, claims 1, 3-7 and 25-33 are under prosecution; however, the claims included in the grounds of rejection do not include claims 29-33. Thus, in order to ensure that the record is clear, Appellants repeat the Concise Statement of Issues set forth in the Appeal Brief. If for any reason, this Concise Statement of Issues does not exactly set forth the grounds of rejection, the Examiner is requested to correct the record in order that the Board rules upon the correct grounds of rejection.

(A) Whether claims 7 and 25 are properly rejectable under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Appellants regard as the invention.

(B) Whether claims 1, 3, 5, 26 to 28, 32 and 33 are properly rejectable under 35 U.S.C. § 103(a) as being unpatentable over Matsumura et al. (hereinafter "Matsumura"), U.S. Patent No.

5,151,871, in view of Kawanabe et al. (hereinafter “Kawanabe”), U.S. Patent No. 6,133,557, or Yoshida et al. (hereinafter “Yoshida”), U.S. Patent No. 6,080,970.

(C) Whether claims 4, 6 and 29 to 31 are properly rejectable under 35 U.S.C. § 103(a) as being unpatentable over Matsumura in view of Kawanabe or Yoshida, as applied to claims 1, 3, 5, 26 to 28, 32 and 33, and further in view of Okuda et al. (hereinafter “Okuda”), U.S. Patent No. 4,804,823.

(D) Whether claims 7 and 25 are properly rejectable under 35 U.S.C. § 103(a) as being unpatentable over Matsumura in view of Kawanabe or Yoshida, as applied to claims 1, 3, 5, 26 to 28, 32 and 33, and further in view of Kubota et al. (hereinafter “Kubota”), U.S. Patent No. 5,643,483, or Kimura, U.S. Patent No. 5,331, 134.

Grouping Of Claims

The Examiner’s Answer inaccurately sets forth the Grouping of Claims by only referencing claims 1, 3-7 and 25-28. As noted above, the claims under prosecution are claims 1, 3-7 and 25-33. Appellants respectfully submit that their Brief includes a statement that claims 1, 3-7 and 25-33 do not stand or fall together and provides reasons as set forth in 37 C.F.R. 1.192(c)(7) and (c)(8). Thus, for each ground of rejection included in the Examiner's Final Rejection that applies to more than one claim, the rejected claims do not stand or fall together for the reasons given in the Appeal Brief.

Indefiniteness Rejection Under 35 U.S.C. 112, second paragraph

Appellants respectfully submit that one having ordinary skill in the art would readily understand the scope of content of claims 7 and 25. In this regard, one having ordinary skill in the art would readily understand that the aspect ratio is the width of the heating body/thickness of the heating body, and this definition is clearly set forth in Appellants' application, including the originally filed specification, at page 13, lines 14-17. This definition is in conformance with its art recognized meaning which includes a ratio of one dimension to another.

Attention is directed to the MPEP 8th Edition, Section 2106, under the heading "Review the Claims", wherein it is pointed out that:

Office personnel must rely on the applicant's disclosure to properly determine the meaning of terms used in the claims. *Markman v. Westview Instruments*, 52 F.3d 967, 980, 34 USPQ2d 1321, 1330 (Fed. Cir.) (*en banc*), *aff'd*, U.S. , 116 S. Ct. 1384 (1996). An applicant is entitled to be his or her own lexicographer, and in many instances will provide an explicit definition for certain terms used in the claims. Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. *Toro Co. v. White Consolidated Industries Inc.*, 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999) (meaning of words used in a claim is not construed in a "lexicographic vacuum, but in the context of the specification and drawings."). Office personnel should determine if the original disclosure provides a definition consistent with any assertions made by applicant. See, e.g., *In re Paulsen*, 30 F.3d 1475, 1480, 31 USPQ2d 1671, 1674 (Fed. Cir. 1994) (inventor may define specific terms used to describe invention, but must do so "with reasonable clarity, deliberateness, and precision" and, if done, must " 'set out his uncommon definition in some manner within the patent disclosure' so as to give one of ordinary skill in the art notice of the change" in meaning) (quoting *Intellicall, Inc. v. Phonometrics, Inc.*, 952 F.2d 1384, 1387-88, 21 USPQ2d 1383, 1386 (Fed. Cir. 1992)). Any special meaning assigned to a term "must be sufficiently clear in the specification that any departure from common usage would be so understood by a person of experience in the field of the invention." *Multiform Desiccants Inc. v. Medzam Ltd.*, 133 F.3d 1473, 1477, 45 USPQ2d 1429, 1432 (Fed. Cir. 1998). If an applicant does not define a term in the specification, that term will be given its "common meaning." *Paulsen*, at 30 F. 3d 1480, 31 USPQ2d at 1674."

Moreover, as stated in 2173.05:

When the specification states the meaning that a term in the claim is intended to have, the claim is examined using that meaning, in order to achieve a complete exploration of the applicant's invention and its relation to the prior art. *In re Zletz*, 893 F.2d 319, 13 USPQ2d 1320 (Fed. Cir. 1989).

Thus, Appellants respectfully submit that the aspect ratio recited in Appellants' claims 7 and 25 is the width of the heating body/thickness of the heating body which is readily apparent from its definition thereof supplied in the originally filed specification which is consistent with its ordinary meaning. Therefore, this ground of rejection should be withdrawn.

Rejections Based Upon Prior Art

Appellants are primarily relying upon the arguments presented in the Appeal Brief, and are submitting the following arguments to emphasize and expand upon their previously submitted arguments. Therefore, for the sake of brevity, Appellants are not repeating each of the arguments previously submitted, and are only highlighting certain arguments based upon assertions made in the Examiner's Answer

In the Examiner's Answer, the Examiner notes Appellants' argument that the teachings of the secondary references, Kawanabe and Yoshida, are not applicable to the primary reference, Matsumura, but considers that both Kawanabe and Yoshida teach the advantages of having the ceramic substrate with aluminum nitride because of its thermal conductivity and resistance to corrosion and heat resistance. The Examiner's Answer asserts that such is proper motivation to allow one of ordinary skill in the art to modify the alumina ceramic substrate in Matsumura with the alternative material such as aluminum nitride as the devices shown are used to provide effective heat

to heat semiconductor wafer. Moreover, the Examiner's Answer asserts that Yoshida also shows alumina and aluminum nitride as the materials that are usable alternatively. Still further, it is asserted that the difference in the heating body arrangements in the ceramic substrate would not deter or teach away one of ordinary skill in the art from using such ceramic materials.

In response to these arguments, Appellants respectfully note that in order to be a proper rejection, the rejection must establish where the prior art teaches or suggests each and every feature recited in Appellants claims. In this regard, Appellants respectfully submit that their invention, as recited in independent claims 1 and 33, includes a ceramic heater comprising a **disc-shaped nitride or carbide ceramic substrate** and a **heating body formed on a surface of the substrate opposite to a heating surface thereof**. Because the heater according to the presently claimed invention has a disc shape, it has an effect of uniformly heating as compared with a heater having a square shape. Also, the heater according to the presently claimed invention has a substrate made of nitride or carbide ceramic so that the heat conductivity of the heater is high, and the temperature distribution on the heating surface can be made small.

Therefore, in order to constitute an appropriate rejection of Appellants' claimed subject matter, any combination of prior art must, at a minimum, teach or suggest a ceramic heater comprising a **disc-shaped nitride or carbide ceramic substrate** and a **heating body formed on a surface of the substrate opposite to a heating surface thereof**.

In contrast to Appellants' disclosed and claimed invention, Matsumura discloses a heater in which a heating body is formed on an alumina substrate and it appears that the elements of heating body of Matsumura are square or rectangular shaped.

The rejection relies on the disclosures of Kawanabe or Yoshida to overcome the deficiencies of Matsumura. However, Kawanabe and Yoshida disclose heaters wherein the heating body is embedded in the inside of the ceramic substrate. Appellants respectfully submit that one having ordinary skill in the art would not have been motivated to combine the disclosures of either of Kawanabe or Yoshida with that of Matsumura. Moreover, even if for the sake of argument the disclosures were combined, the instantly claimed invention would not be at hand.

With regard to the above, each of Kawanabe and Yoshida is directed to wafers and wafer holding apparatus which are structurally different from that disclosed by Matsumura. In particular, Matsumura includes an upper plate 13 and a conductive thin film 14 on the underside of the upper plate 13. In contrast, Kawanabe discloses wafers wherein heating resistor 12 is embedded in the base body 11, and Yoshida discloses a heating resistor 4 buried in the ceramic substrate 2. Thus, one having ordinary skill in the art would not have been motivated to combine the disclosure of either of Kawanabe or Yoshida with Matsumura to provide a ceramic heater comprising a **disc-shaped nitride or carbide ceramic substrate** and a **heating body formed on a surface of the substrate opposite to a heating surface thereof**. In this regard, the rejection must establish why it would have been obvious to modify Matsumura (a) to make the heater elements of Matsumura disc-shaped, (b) to make the heater elements of Matsumura disc-shaped with the disc-shaped ceramic substrate of Matsumura being a nitride or carbide ceramic substrate, and (c) to have the heating body of Matsumura formed on a surface of the substrate opposite a heating surface.

While each of Kawanabe and Yoshida disclose disc-shaped substrates, as noted above each of Kawanabe and Yoshida discloses an embedded heating body as compared to a heating body on

a surface of the substrate opposite a heating surface. In this regard, attention is further directed especially to the drawings of Kawanabe, and a description of Example 1, at column 6, line 27 et seq. wherein heating resistor 12 is disclosed as being embedded in the base body 11, and to the drawings of Yoshida, and a description of the drawings at column 4, line 16 et seq. wherein strip heating resistor 4 is buried in ceramic substrate 2. Thus, even if for the sake of argument the disclosure of either of Kawanabe or Yoshida was combined with that of Matsumura, the instantly claimed invention would not be present. In particular, any combination of the documents would not arrive at a ceramic heater comprising a disc-shaped nitride or carbide ceramic substrate and a heating body formed on a surface of the substrate opposite to a heating surface thereof.

Still further, while Yoshida does disclose, at column 4, line 27 et seq. that the ceramic substrate can be alumina, silicon dioxide, sialon and aluminum nitride, and is preferably aluminum nitride, no proper combination would arrive at Appellants' invention. Appellants provide the only disclosure of any motivation for providing a ceramic heater which includes a disc-shaped ceramic substrate, a disc-shaped ceramic substrate made of nitride ceramic or carbide ceramic, and a heating body formed on a surface of the substrate opposite a heating surface. While a rejection can utilize selective portions of references in combination with each other, the test for obviousness is what the combined teachings of the references would have suggested to one of ordinary skill in the art, and all teachings in the prior art should be considered.

Appellants respectfully submit that there is no teaching or suggestion in the prior art of record to arrive at Appellants' disclosed and claimed invention to provide a ceramic heater which includes a disc-shaped ceramic substrate, a disc-shaped ceramic substrate made of nitride ceramic or carbide

ceramic, and a heating body formed on a surface of the substrate opposite a heating surface.

Accordingly, a prima facie case of obviousness has not been established.

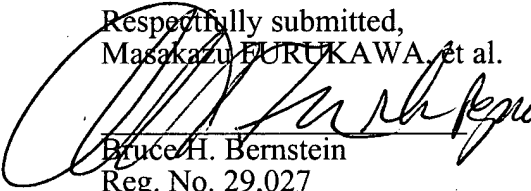
Appellants therefore once again respectfully submit that a prima facie case of obviousness has not been established, and the rejections should be withdrawn. However, even if a prima facie case of obviousness were established in this case, the instantly claimed invention yields unexpected results sufficient to rebut a prima facie case of obviousness. In the instant case, the superior characteristics of the claimed invention are disclosed throughout the specification, and are also shown in Table 1 on page 36 of the application. Moreover, the Declaration Under Rule 132 of Yasutaka Ito discusses the benefits of having a heating body arranged on the surface of the substrate as compared to the heating body being embedded therein. The Declaration is further directed to temperature uniformity benefits associated with having a disc-shaped ceramic substrate of nitride or carbide as recited in Appellants' claims. For example, as can be seen from a review of the Declaration, it discusses that when the heating body is arranged on the surface of the substrate, the distance for thermal diffusion can sufficiently be ensured as compared with the case of embedding the heating body in the substrate, and the temperature uniformity of the heating surface is excellent. In contrast, when the heating body is embedded in the body of the substrate, the distance between the heating body and the heating surface becomes relatively small and the thermal distribution of the heating body pattern is reflected to the heating surface and hence the temperature difference of the heating surface becomes large.

Moreover, with respect to Table 1 at page 36 of Appellants' specification, it is noted that this table summarizes the results of Appellants' Examples beginning at page 26 of the specification. For

example, attention is directed to Examples 1 and 2, which utilize an aluminum nitride disc-shaped ceramic substrate and a silicon carbide ceramic substrate, respectively, the temperature difference between maximum and minimum temperatures on the heating surface is 8 and 9 degrees, as seen from Table 1, while the temperature difference in Comparative Example 2, wherein the heater is made of alumina substrate is 22 degrees. The Examiner's Answer contends that this shows differences in results due to different sizes and material of the heating body, and not the arrangement of the heating body with respect to the ceramic substrate. However, this shows that the presently claimed invention is capable of providing a very small temperature difference on the heating surface. Moreover, these Examples 1 and 2, when compared to Examples 4-7 wherein the heating body is inside the heater, establish a consistently low response time with a low temperature difference.

From Appellants' Appeal Brief and the above, it is apparent that Appellants' invention is patentable over the prior art, whereby the indefiniteness and obviousness rejections are improper, and reversal of the rejections is respectfully requested.

Respectfully submitted,
Masakazu FURUKAWA, et al.


Bruce H. Bernstein
Reg. No. 29,027

33,084

March 10, 2003
GREENBLUM & BERNSTEIN P.L.C.
1950 Roland Clarke Place
Reston, VA 20191
(703) 716-1191



OTENBLUM & BERNSTEIN, P.L.C.
Intellectual Property Causes
 1941 Roland Clarke Place
 Reston, VA 20191
 (703) 716-1191

AF/3742

Attorney Docket No. P18520In re application of Shinji FURUKAWA et al.

Serial No. : 09/462,067
 (National Stage of PCT/JP99/03086)
 I.A. Filed : June 9, 1999
 Examiner : S. Paik

For : CERAMIC HEATER AND METHOD OF PRODUCING THE SAME ELECTRICALLY
 CONDUCTIVE PASTE FOR HEATING BODY

THE COMMISSIONER OF PATENTS AND TRADEMARKS
 Washington, D.C. 20231

Sir:

Transmitted herewith is an Appellant's Reply Brief 37 C.F.R. 1.192(B)(1) in response to Examiner's Answer (in triplicate) in the above-captioned application.

- ___ Small Entity Status of this application under 37 C.F.R. 1.9 and 1.27 has been established by a verified statement previously filed.
 ___ A verified statement to establish small entity status under 37 C.F.R. 1.9 and 1.27 is enclosed.
 ___ An Information Disclosure Statement, PTO Form 1449, and references cited.
X No additional fee is required.

The fee has been calculated as shown below:

Claims After Amendment	No. Claims Previously Paid For	Present Extra	Small Entity		Other Than A Small Entity	
			Rate	Fee	Rate	Fee
Total Claims: 21	*21	0	x 9=	\$	x 18=	\$ 0.00
Indep. Claims: 3	**3	0	x 42=	\$	x 84=	\$ 0.00
Multiple Dependent Claims Presented			+140=	\$	+280=	\$ 0.00
Request for Extension of Time				\$		\$ 0.00
Total:				\$	Total:	\$ 0.00

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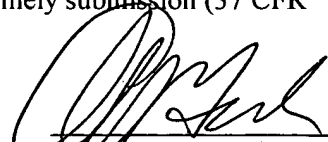
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X Any patent application processing fees under 37 C.F.R. 1.17, including any required extension of time fees in any concurrent or future reply requiring a petition for extension of time for its timely submission (37 CFR 1.136)(a)(3).


 Bruce H. Bernstein
 Reg. No. 29,027
 33,094